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Physical Therapy Techniques for Treating Patients with Traumatic Brain Injury (TBI)

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PHYSICAL THERAPY TECHNIQUES FOR TREATING PATIENTS WITH TRAUMATIC BRAIN INJURY (TBI)

by

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This Independent Study, submitted by Daren M. Flolo in partial fulfillment of the requirements for the Degree of Master of Physical Therapy from the University of North Dakota, has been read by the Faculty Preceptor, Advisor, and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.

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Signature Daren Flolo

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ABSTRACT

Traumatic brain injury (TBI) can be devastating. Survivors of TBI and their families face complex needs that challenge physical therapists. To respond to this challenge, physical therapists need specific knowledge in regard to epidemiology, etiology, specialized treatment techniques, and the impact of the TBI on patients and their families.

With improvements in medical technology, the number of children and adults surviving brain injuries has increased. Many of these survivors require specialized training to improve impairments as a result of their injuries.

Physical therapists play a vital role in the evaluation and treatment of the patient with traumatic brain injury. In a multidisciplinary team, physical therapists have a common purpose and goal along with other health care professionals, yet they possess a particular expertise. Physical therapists treat neuromuscular deficits in traumatic brain injury patients to maximize functional capabilities.

The purpose of this study is to 1) increase awareness of the problems associated with TBI patients, 2) provide information and resources specific to the needs of the patients and their families, 3) supply a framework of specialized TBI

treatment techniques for approaching the behaviorally and emotionally disordered patient.

CHAPTER I

INTRODUCTION

Traumatic brain injury (TBI) has been identified as the "silent epidemic."[1] Population growth and an increase in motor vehicle accidents have multiplied the incidence of TBI. Approximately 9.75 million people in the United States sustain some form of head trauma each year. Approximately one-quarter of these injuries include skull fractures and intracranial injuries resulting in long-lasting and often permanent alterations in cognitive, emotional, and behavioral functioning.[2]

According to the Head Injury Association of North Dakota (HIA/ND), in 1992, there were 474 recorded incidents of TBI of which 330 patients survived and 144 died. The HIA/ND also states that annually 75,000 to 100,000 Americans will die as a result of brain injury and 70,000 to 90,000 will endure life-long debilitating loss of function. Reports from the HIA/ND estimate that in 1995 the economic cost alone for the care of patient's with TBI will approach $25 billion.[4]

The brain is an extremely complicated organ that plays a role in all human activities. It is important to realize that every behavior is in some way directed by the brain. Behaviors may be relatively simple (movements, breathing) or may

be very complex (making decisions and plans, communicating our ideas and needs). Damage to various lobes of the brain results in a variety of symptoms. Because of the complex connections of the brain, it is hard to predict how an injury to a certain location of the brain will affect a particular area of everyday functioning.

Due to the complexity of TBI and its resulting disorders, a variety of specialists are required to meet the needs of the injured individual and his or her family. Each specialist brings a unique expertise to the multidisciplinary team approach to brain injury rehabilitation. The team of professionals work together to both rehabilitate and educate the patient and family.

The rapid growth in the number of surviving TBI patients presents a tremendous challenge for physical therapists. This challenge must be confronted by increasing the opportunity for reflection, professional training and development in the treatment of emotional and behavioral consequences secondary to TBI. The purpose of this study is to supply a framework of specialized TBI treatment techniques for approaching the behaviorally and emotionally disordered patient. In addition, epidemiology, etiology, and information and resources specific to the needs of the patient and family will be discussed.

CHAPTER II

BACKGROUND

Definition

The National Head Injury Foundation, Inc. defines traumatic brain injury as follows:

> Traumatic head injury is an insult to the brain, not of a degenerative or congenital nature but caused by an external physical force that may produce a diminished or altered state of consciousness, which results in impairment of cognitive abilities or physical functioning. It can also result in the disturbance of behavioral or emotional functioning. These impairments may be either temporary or permanent and cause partial or total functional disability or psychosocial maladjustments.[5]

Epidemiology

A traumatic brain injury (TBI) occurs every 16 seconds nationwide.[6] The Vital Statistics of the United States indicate that accidents in general are the fourth most common cause of death for all ages and the leading cause of death for persons under 34 years old.[7] Fifty percent of these accidental deaths result from motor vehicle accidents. In 62% of the motor vehicle accidents, head injury was the cause of death.[8]

Each year, there are 22 to 25 fatal head injuries per 100,000 persons, and over 500,000 injuries are significant enough to require hospitalization.[9] In any

given community of 100,000 people, there will be approximately 200 incidences of TBI per year.

Two-thirds of those with traumatic brain injury are between the ages of 15 and 25 years.[6] TBI patients are more frequently male than female with a ratio of 2:1, and 72% of TBI patients are single at the time of their accident.[6] Preexisting alcohol abuse among persons with traumatic brain injury is also common with as many as 58% reporting a history of alcohol abuse or dependence and 25% reporting previous treatment for substance abuse.[10] Characteristics of the TBI patient also reveal that the majority are in lower social and economic groups irrespective of their country or origin.[11]

Advances in medical technology over the last few decades have made it more probable that persons with severe head injuries will survive. Of those who survive the traumatic event, many sustain serious head injuries and are left with physical, cognitive, and behavioral deficits that significantly alter premorbid lifestyle. As previously mentioned, the majority of those injured are under the age of 30, with a normal life expectancy after their injury.[9] The annual incidence of moderate/severe TBI is more than that for spinal cord injury, multiple sclerosis, cerebral palsy, and muscular dystrophy combined.[6] Physical therapists and other rehabilitation professionals require specialized training to develop the programs and treatment needed to meet the challenging problems associated with the TBI patient.

Pathophysiology

Damage to the brain depends on the nature, direction, and magnitude of the forces applied to the skull, brain, and body at impact.[11] Movement of the skull that is suddenly halted or a direct blow to the head causes displacement of brain tissues. Because the brain is gelatinous rather than rigid, momentum causes it to shift until it is resisted by the skull or underlying dural septa.[11]

Local (focal) damage refers to the brain injury that is localized to the site of impact of brain tissue on the skull.[12] The damage may take the form of a contusion or laceration or both. Contusions are defined as "a bruise or an injury in which the skin is not broken."[17] Contusions may be mild or severe and can result in surface hemorrhage. In the case of a severe blow to the head, contusions to the brain can occur at two sites: (1) at the point of impact and (2) at the point opposite the impact where the brain tissue makes contact with the skull as it rebounds, termed a countercoup injury.[13]

Lacerations are defined as "wounds or irregular tearing of the flesh."[17] Lacerations to brain tissue are caused when the bony irregularities on the inner surface of the skull abrade the brain tissue. Depressed skull fractures are a major cause of local contusions and lacerations and are associated with a high incidence of fatality.[13]

Local brain damage by either a contusion or laceration may result in the tearing of vascular tissues of the brain. When this tearing of vascular tissue occurs, it may result in a hematoma. A hematoma is a mass of blood (blood clot)

located in the interstitial space caused by a break or tear in a blood vessel. If severe enough to compress brain tissue or inhibit oxygen to the brain, a hematoma may result in additional brain damage, characterized by decreased levels of consciousness and progressive motor dysfunction. Computerized axial tomography (CAT) scans after the TBI will show a shift of normal anatomic structures in the brain away from the pressure of the hematoma.[14]

In addition to the local damage, rotational and shaking forces applied to the brain can result in diffuse brain damage. This is characterized by scattered lesions occurring throughout the brain, resulting in severe widespread degeneration of white matter.[15] This is a more severe brain injury and the neurological signs exhibited by the patient with diffuse white matter shearing are fairly typical. The patient is deeply comatose in a vegetative state with abnormal extensor posturing of the limbs and usually some autonomic dysfunction. Diffuse brain injury is often evident on a CAT scan by the presence of punctate hemorrhages, or tiny spots or points of hemorrhage.[27]

The neurological signs that result from local and diffuse brain damage are directly related to the location of the injury. For example, damage over the motor cortex will result in contralateral weakness of the face and arm. When the lesion is in the frontal lobe, there may be no sign of neurologic dysfunction unless both frontal lobes are involved which would likely cause considerable behavior disturbances.

Brain swelling and compression may progress to the point of a brain herniation. A herniation is defined as "a protrusion of an organ or part of an organ through a surrounding wall or cavity."[25(p512)] If a herniation of the brain tissue occurs, then a new set of neurological signs may emerge. These new neurological signs are often referred to as the so-called "false-localizing" signs which include oculomotor or abducen nerve palsies and unilateral weakness of the arm and leg.[13]

Secondary brain damage occurs over time as a direct result of the initial injury and can further impair brain function. Secondary insults include the following: (1) increased intracranial pressure, (2) arterial hypoxia, (3) cerebral edema, (4) arterial hypotension, (5) impaired salt and water balance (hyponatremia), (6) intracranial infection, and (7) hydrocephalus.[11] Neurological signs displayed by the patient with secondary brain damage will vary according to factors including the type, duration, location, and severity of the secondary insult. These factors are also important when presenting standard ways in which to measure the severity of TBI whether it is primary or secondary. The next section will discuss these measurement scales and their relevance as prognostic indicators.

Measurement Scales Following TBI

In the past two decades, a means to measure virtually every aspect of traumatic brain injury (TBI) has been developed. The following will describe those measurement scales most commonly used after TBI. The first two are

used in order to provide a basic understanding of the severity of injury. The severity of injury requires the consideration of many factors including the type, nature, and location of the brain injury; the duration of the comma or loss of consciousness; and findings on clinical tests, such as computerized axial tomography (CT) scans or magnetic resonance imaging (MRI). However, the scales below present some standard ways in which the severity of injury is measured and are currently considered the most indicative of the traumatic brain injury patient's prognosis and potential for progress.

The most consistent result of traumatic brain damage, even when it is mild, is impairment of consciousness. The best guide to the severity of the brain damage is the degree and duration of altered consciousness.[11] In the emergency room, it is useful to classify patients by their level of consciousness. For example, the first determinate of severity is classifying those who are conscious and already talking when they arrive versus those who are not. Those who can talk can be further divided into two groups: those who have had a period of amnesia following their injury and those who can remember everything clearly. For those who are unconscious on arrival, the depth and duration of the coma provides the best guide to the severity of the brain damage. This is readily described in terms of the Glasgow Coma Scale.[11]

The Glasgow Coma Scale (Table 1) was developed by Teasdale and Jennett[11] to measure the severity of a brain injury and provide an objective measure of a person's level of responsiveness. The scale rates an individual in

Table 1.—Glasgow Coma Scale[11]

EYE OPENING

Spontaneous	4
To speech	3
To stimuli	2
None	1

BEST MOTOR RESPONSE

Obeys commands	6
Responds to stimuli	5
Withdraws from stimuli	4
Flexor responses	3
Extension responses	2
None	1

VERBAL RESPONSE

Oriented	5
Confused conversation	4
Inappropriate words	3
Incomprehensible sounds	2
None	1

Total Score:

8 or less	Severe brain injury: (True Coma)
9 - 12	Moderate brain injury
13 - 15	Mild brain injury

three critical areas: eye opening, best motor response, and verbal responses. Severity of the patient's TBI is determined by the sum of the best response in each category. Scores can range from three for a person who is totally unresponsive to as high as 15 for a person who can open his or her eyes spontaneously, make voluntary movements in response to commands, and talk coherently.

Another system for rating impaired consciousness is post traumatic amnesia (PTA) (Table 2).[11,16] This scale is used after the patient recovers from his or her unconsciousness. It can be defined as the length of time from the accident to recovery of continuous memory. After the patient has recovered, the best guide to the severity of the brain damage is the duration of the post-traumatic amnesia (PTA). There is now abundant evidence that the duration of PTA correlates well with late outcome as well as with the interval before patients return to previous lifestyle.[11,12,14]

Another measurement scale used following a TBI is the Rancho Los Amigos Scale (Table 3).[13,16] This scale does not measure the severity, but rather the level of recovery of the patient after the TBI. It was developed by the staff at the Rancho Los Amigos Medical Center in Downey, California. This scale defines eight progressive stages after TBI (Table 3). The scale is widely used by clinicians, hospitals, and rehabilitation programs to provide a common frame of reference for understanding the quality of responses and behaviors of the traumatic brain injured patient. It can also be useful in determining the patient's

Table 2.—Definition of Severity of Post Traumatic Amnesia (PTA)[5]

PTA DURATION	SEVERITY OF INJURY
Less than 5 minutes	Very Mild
5 to 60 minutes	Mild
1 hour to 24 hours	Moderate
1 to 7 days	Severe
1 to 4 weeks	Very Severe
More than 4 weeks	Extremely Severe

Table 3.—Rancho Los Amigos Scale of Cognitive Function[5]

Level I.	No Response: Deep coma, appearance of deep sleep Unresponsive to stimuli.
Level II.	Generalized Response: Reacts inconsistently and non-purposefully to stimuli in a nonspecific manner.
Level III.	Localized Response: Reacts specifically, but inconsistently to stimuli. May inconsistently follow simple commands.
Level IV.	Confused-Agitated: Heightened state of activity. Poor processing of information. Behavior may be bizarre and not related to environment but internal state of confusion. Short attention and little carryover.
Level V.	Confused, inappropriate, non-agitated: Alert and able to respond to simple commands. With increased complexity of commands and no external structure, responses are non-purposeful, random, or fragmented.
Level VI.	Confused-Appropriate: Able to show goal directed behavior with cuing and external structure. New learning and retention are difficult.
Level VII.	Automatic-Appropriate: Appears oriented but may be robot-like with shallow recall. Superficial insight with decreased judgment and problem solving abilities. Requires structure to initiate social and avocational tasks. Lack of realistic planning for the future. Independent in self-care. Requires minimal supervision in home and community for safety.
Level VIII.	Purposeful-Appropriate: Alert and oriented. Able to recall and integrate past and recent events. Aware of and responsive to environment. Independent in home and community skills. May show decreased abilities relative to pre-morbid abilities, reasoning, tolerance for stress and judgment in emergencies or unusual circumstances.

ability to participate in rehabilitation activities and the level of supervision required.

As one can see, measuring traumatic brain injury by using the above scales is not precise. Each has strengths and limitations. However, these scales are particularly useful in research because they provide a means to compare and contrast groups of patients with TBI. In this way, they have contributed to the advancement of knowledge about what types of treatments are beneficial with this patient population.

CHAPTER III

TREATMENT STRATEGIES

Rehabilitation of patients with traumatic brain injury (TBI) is a long, intensive process. Patients who sustain TBI may exhibit a variety of mild to severe neurological, orthopedic, cognitive, behavioral, and emotional deficits. Physical therapists who treat patients with traumatic brain injury must address not only the patient's physical deficits, but also the emotional and behavioral deficits. This chapter explains emotional and behavioral mannerisms of patients with TBI and the various treatment techniques available during the rehabilitation process to address these issues.

To understand the nature of behavioral dysfunction, it is necessary to state the operational definition of it. For the purpose of this discussion, behavioral dysfunction is defined as "those overt actions (behaviors) that result in socially maladaptive interactions between the patient and environment."[11(p4)] The list of behavioral dysfunctions is lengthy and varied, ranging from agitation, emotional lability (mood swings), depression, and hyperactivity to aggression, sexual inappropriateness, and elopement (running away).[11] The following explanations and treatment strategies will provide a guide for families and professionals treating patients with traumatic brain injury. In addition to this

working guide, each team member will need to utilize treatment creativity depending upon the patient's premorbid status and overall complexity of the patient's injury. The patient's premorbid status can be provided by the family and is a very effective tool for input and education. With this in mind, the family's role in the team approach to TBI rehabilitation is extremely important and will be discussed in the following chapter.

Agitation

Agitation is common during the initial stages of recovery following a traumatic brain injury (TBI). According to the Rancho Scale, the patient experiencing agitation would likely be at Level IV (Table 3). Agitation is defined as "excessive restlessness, increased mental and physical activity associated with anxiety."[17(p54)] Examples include perseverative behavior (pacing, finger drumming), frequent shifting of body position, searching for items frantically, talking continuously, and repeating the same thought or idea. Also, many agitated TBI patients spend excessive time on preparatory activities before a task to avoid performance of the task and the anxiety associated with the task.[11,18,19] Agitated TBI patients may also become aggressive and inappropriate as a consequence of their agitation.

Treatment strategies for the therapist and family involve modeling calm behavior at all times. Short, frequent breaks versus long breaks during treatment sessions should be used to avoid excessive time where the patient is able to ruminate. An example of rumination may be the patient's inability to

dismiss or dislodge a single idea or set of thoughts from a previous task. By decreasing break time, the patient will spend less time reflecting back and more time moving ahead with the task at hand.

Family and health care professionals must also be careful not to present complex activities without basic orientation and instructions because complex activities without proper instruction may further confuse and agitate the TBI patient. Although auditory stimulation is important for the rehabilitation of the TBI patient, too many people talking at once may be counterproductive because the agitated patient is already confused and has a decreased attention span. Thus, the environment should be restructured to eliminate excessive distractions. Examples include treating the patient in a private corridor and instructing team members to talk one at a time. In addition, those team members not directly talking with the patient should stand a distance from the patient to eliminate unnecessary distractions.

It may also be helpful to vary the treatment activities to avoid boredom because repetitive treatment sessions make it difficult to grasp the attention of an already fatigued and confused patient. For example, if the patient enjoys remote control cars, this may be more effective to promote prolonged standing in the standing table than tic-tac-toe or other table games.

Lastly, the patient may often feel a lack of control in decision making and should be encouraged to be an active member in every situation. Allowing the patient to alter or terminate a particular treatment activity or leave treatment

sessions early may be an important part of giving the patient control in his or her rehabilitation and recovery. The patient should be able to win some of the battles rather than team members trying to control all the situations at all times.[18]

Anger

It is a natural phenomena for traumatic brain injury (TBI) patients to react to their deficits with feelings of frustration and anger. Anger is most commonly seen at Level IV of the Rancho Scale, but can be seen at any of the TBI recovery stages. The patient will attempt to use anger to deal with a loss of self and lifestyle, difficulty verbalizing feelings, and judgment and decision making problems.[18,20] Anger is a coping mechanism and becomes an outlet for grief and frustration.[20]

Treatment techniques for anger include the team members' own awareness of the complexity of TBI and that the patient is not in control of his or her actions.[11,21] Anger is usually a spontaneous act with little or no forethought or purpose. The best technique when treating an angered TBI patient is to defuse the patient's anger prior to escalation. This may be accomplished by teaching the patient in advance what may cause the anger, stopping and talking about the problem, helping the patient relax, or walking away from the confrontation. Also, allowing the patient to verbalize or validate what he or she is feeling, but at the same time, being careful not to be patronizing or condemning, is important. Being direct about the affect the anger has had on others and telling the patient if a particular person was hurt, offended, or

embarrassed by his or her actions is also important in allowing the patient to realize the inappropriateness of the behavior.

As a patient with TBI relearns judgment, reasoning, and communication, excessive anger will diminish. Rehabilitation professionals and family members must teach the patient better ways to deal with the anger, allow the patient to recognize the result of the anger, and to make amends for it.[20]

Denial

Denial can be a major problem during rehabilitation of the TBI patient. If the patient cannot recognize the deficits he or she is experiencing, he or she will not see the need to give full effort during treatment sessions. Denial most often occurs at Level VII of the Rancho Scale and is usually a result of a disruption in the coping mechanisms of the brain. These coping mechanisms allow one to step away from oneself and evaluate behavior. Denial may also occur as a defense mechanism to preserve one's self-image. It is common for patients with traumatic brain injury to admit having slight physical difficulties, but rarely admit to decreased cognitive skills or perceptual deficits.[18,20]

TBI patients in denial often attempt tasks which are too difficult and/or dangerous. They may deny there has been any change in their work skills or their ability to perform premorbid activities. Therefore, they refuse to modify work goals or living situations.

The TBI patient may also deny memory or cognitive impairments. For example, the patient may blame others for stealing his or her belongings

because he or she cannot remember where they were put and do not realize that this relates to the injury.[18]

Treatment of traumatic brain injury patients in denial consists of allowing the patient to fail at an activity at which they are sure they will succeed. It is important to enforce certain safety restrictions during these activities to ensure that the patients do not harm themselves or others. It may be helpful to work on ambulation skills in which the patient may fail with two or more people, thus providing a safety net for the patient. This treatment technique allows the patient to learn that the activity is not appropriate and may even be dangerous. However, in some cases, the patient may place the blame on others for failure. Videotaping the patient in denial will sometimes help them with the realization that a particular deficit, such as the inability to ambulate correctly, exists. Professionals must approach the patient in a calm, non-challenging manner when discussing these deficits.

Another treatment technique is to allow the patient to discuss long- and short-term goals for the future. The patient should hold on to the long-term goals, even though they may be inappropriate at the present time, but focus on more appropriate short-term goals. The patient should be involved in goal setting by explaining the skills needed to accomplish these goals and creating a list accordingly. The patient, family, and therapist will then review those skills and determine those that are strong and those that are weak relative to the goal, and progress the patient as needed toward the accomplishment of the goal.[18] As

with all behavioral and emotional deficits, the person is not being stubborn; the behavior is a product of a neurological deficit.

Depression

Depression is a common emotional consequence following traumatic brain injury (TBI).[18,19] Depression is common at all levels of the Rancho Scale and may occur throughout the continuum of care. Patients with TBI respond to loss of function similar to someone who has lost a friend or family member. This process includes denial, anger, depression, and acceptance.[11,20] Depressed patients may exhibit symptoms such as lack of interest in life, excessive sleeping, loss of ability to experience pleasure, lack of motivation, increase in withdrawal from family and friends, loss of appetite, and excessive television watching.[8,22] These behavioral and emotional consequences of TBI should not be confused with premorbid depression, drug abuse, endocrine dysfunction, and medications which may all contribute to depression.[8,23]

There is much controversy in the literature regarding the effects of anti-depressant medication for the treatment of depression in patients following traumatic brain injury.[11] If depression is a major obstacle in the rehabilitation, medication might be considered. However, patients should be closely monitored for other effects of the medication on cognition and behavior. Other options for treatment are professional group therapy and increased social interactions.[11,19,20]

Team members should remember to evaluate the patient's level of physical activity and socialization, feelings of worthlessness, self-esteem,

concern with prognosis, and attempts at self injury.[19] The family may assist the patient by providing adequate nutrition, fluids, and assistance with grooming and other activities of daily living, which will help their loved one feel more energetic and take steps towards a more positive self-image. The family and other team members should be sure not to reinforce the depressed patient's negative statements and should maintain an optimistic attitude.

Impulsiveness

The impulsive patient with a traumatic brain injury (TBI) may act or speak without thinking of the consequences. Impulsiveness is most often seen at Levels IV and V of the Rancho Scale, but can be seen at any of the TBI recovery stages. Often, the patient will apologize afterwards, but repeat the behavior in the future. This can be frustrating for the family and therapist who interpret the impulsiveness as the patient not trying to or wanting to change. Impulsive behavior can include sexually inappropriate comments and other unacceptable actions.[19] The combination of impulsivity, poor judgment, anger, and egocentrism magnify the difficulty in treating patients with TBI and challenge the team members involved.[18]

The treatment strategies for the TBI patient with impulsive behavior are the same as those previously listed in the anger section. The patient must be instructed to stop, think, and then act. It is important to instruct the patient to wait 15 seconds before responding to a comment, making sure the response is appropriate.[18] Family and team members should be careful about verbally

stopping the patient since this can often lead to unnecessary confrontations. Team members, especially professionals, should set time limits on conversations to let the patient know exactly how much time is allowed. This may be especially hard for patients to understand due to egocentrism and judgment problems.[19]

Lastly, if the impulsiveness appears to be related to anxiety, then the patient will need help to validate the anxiety. An example may be to say "you sound pretty upset about all of this." Then, after exploration of the anxiety or anger, redirection to some alternative stress relievers, such as exercise, relaxation, reading, or writing, may be appropriate.[20]

Irritability

Irritability in a patient with TBI may cause the patient to overreact to stressors in the environment. Irritability is most commonly seen at Level IV of the Rancho Scale, but can be seen at any of the TBI recovery stages. The patient may become more sensitive and irritable to stimuli such as noise (vacuum cleaners, stereos, children playing), light, and temperature. These reactions may be enhanced when the patient is fatigued.[18,20]

Treatment for the irritable TBI patient includes establishing a daily routine so the patient feels more in control and secure with the environment. Family and team members should break tasks into small steps which can be accomplished easily and provide the patient with choices from which to choose as opposed to asking the patient to make an open-ended decision.[20] This will help to supply structure into the patient's decisions and options. It is helpful to decrease stimuli

and incorporate relaxation exercises into treatment sessions. Since changes in schedule can bring on irritability, it is important to fully explain any change in plans well in advance and include the patient as part of the decision making process.[18] Finally, it is important not to challenge or confront the irritable patient but to try to negotiate with the patient regarding what changes will help him/her the most.[18,20]

Lability

Lability is defined as "a state of being unstable or changeable with excessive emotional reactivity associated with frequent changes or swings in emotions and mood."[17(p1065)] Lability is common in all the levels of the Rancho Scale and throughout the continuum of care. The labile mood can be intimidating for the family and therapists, especially if the mood swings are intense. The patient may be perceived as being crazy, influenced by drugs, or immature by those who do not know the underlying situation. The labile TBI patient may exhibit quick and frequent mood swings. These may include crying when discussing the past, then, for no obvious reason, the patient may laugh uncontrollably. These responses are often exaggerated at inappropriate times or in response to constructive criticism.[19]

Treatment for the labile TBI patient includes recognizing that even though the response is strong, the emotion may not be that strong. As with all of the emotional and behavioral disorders, professionals should involve the patient and family in local support groups and contact the facilitator directly to arrange a

one-on-one discussion, if needed.[20] The family and other team members should reinforce positive behavior and utilize diversionary techniques, such as recreation and social involvement.

Team members should be empathetic and reassure the patient that the behavior is a natural occurrence. It is important to praise the patient when emotions are controlled. In addition, the environment should be structured to remove any unnecessary stress factors and allow the patient to leave the room or treatment area if needed.[18] This will allow the patient some control over the rehabilitation process.

Memory

Nearly all traumatic brain injury (TBI) survivors, whether the injury is classified as mild or severe, experience some degree of memory loss. Memory loss is observable in all levels of the Rancho Scale and continues throughout the continuum of care. Problems may involve short-term or long-term memory deficits. It is more typical for TBI patients to experience difficulty with short-term memory loss than long-term memory loss.[18] Memory loss may vary in severity depending upon the additional behavioral complications mentioned above.

Memory deficits pose complex problems during therapy; therefore, patients require a more basic level of instruction and verbal descriptions. Unrelated activities should be kept to a minimum. The patient should practice and demonstrate activities soon after instructions are given.[16] Common strategies to improve memory include verbal cuing, rehearsal, repetition,

counting, and coding. Memory boards or logs are available in some facilities to help the patient maintain a schedule and remember sequences. Spacing activity sessions will keep mental and physical fatigue to a minimum and, in turn, enhance memory.

Family and team members should utilize compensation skills, such as lists, calendars, notices, tape recorders, post-it notes, telephone answering machines, alarm watches, and others. Many patients feel that these compensation devices make them "stick out" as brain injured, but, in reality, they are techniques we all use to some degree. Team members should be sure that the compensations are used in a consistent manner by all those involved with the patient's care to reduce the risk of further confusing the patient.[18]

It is important for the therapists and family to utilize repetition with the patient or loved one because people learn by the process of repetition. In other words, a patient may practice putting the dishes away 25 times with no success at remembering the basic steps, but on the 26th try, the patient may do very well. It appears as though the complexity of the brain suddenly clicks in after a certain number of repetitions.[18,19] As memory improves, therapy aids should gradually be withdrawn to encourage patients to become more functional with cognitive skills.[16,24,25]

Paranoia

Paranoia associated with the TBI patient is due to an inability to pick up appropriate cues, to use logic, and to draw correct conclusions. Paranoia is

most commonly seen in Level V of the Rancho Scale. The patient often does not understand the actions or intentions of other people and can become progressively suspicious and uncooperative. The patient may blame others for taking belongings and refuse to eat certain foods because of the belief that someone is trying to poison him/her. Paranoid patients may insist that people are talking about or laughing at him/her.[18,19]

Treatment strategies for TBI patients with paranoia involve restructuring the environment to alleviate the situation causing the problem. Family and health care professionals should not argue with the patients because their irrational beliefs make it difficult to win an argument.[18] In addition, family and team members should supply different interpretations of a situation or event in order to give the patient a more rational view.

Family and team members should model calm, assured, confident behavior to provide a sense of stability for the patient. Family and professionals should consistently re-evaluate their treatment approach because there are some things the paranoid TBI patient simply cannot change, but team members can alter their approach with positive results.[18,20] Lastly, family and therapists should establish an open and trusting relationship which will foster good communication and is often the most important and effective technique available for treating the paranoid TBI patient.[18]

Obsessional Behavior

Traumatic brain injury (TBI) patients with obsessional behavior often present with repetitive thinking on an idea or thought. This may be partly do to memory deficits because the patient does not realize he or she has previously brought up the idea. Obsessional behavior is most commonly seen at Levels IV and V of the Rancho Scale. A number of patients become excessively concerned about tidiness and become upset if their daily routine is disturbed. It has been suggested that this type of obsessional behavior may be related to pre-morbid obsessional traits.[11,18]

Treatment strategies for the TBI patient with obsessional behavior include the use of videotapes and role playing. Family and health care professionals should ignore the patient's obsessions, if possible, and help the patient practice appropriate behaviors. In addition, the patient should be redirected to a more constructive thought, idea, or activity.[18,24]

The family and team members should encourage the patient to slow down and simplify the environment, to reduce stimulation, and to provide a less confusing environment. Also, emphasizing accomplishments rather than perfection will help to decrease the obsessional behaviors.

CHAPTER IV

THE FAMILY'S ROLE

Family is defined as "a group of people living in the same household who share common attachments, such as mutual caring, emotional bonds, regular interactions, and common goals, which include the health of the individuals in the family."[17(p509)] The family members have lived through and participated in the individual's life experiences. With this in mind, the family is the best source in providing a perspective on behavioral tendencies of the patient. The family can provide information about their family member's interests, habits, vocational and educational background, and pre-injury behavior. Multidisciplinary meetings involving the patient and family can thus be a very effective tool for input and education. Therapists will become more effective with rehabilitation as these meetings will help increase their understanding of the TBI patient's individual behavioral characteristics and his or her likely responses to the environment.[23]

For the family, behavioral problems are perhaps the most devastating aspect of the patient's traumatic brain injury (TBI). Family dynamics and the way in which the patient and family once interacted are usually disrupted with this type of injury. Family members frequently have difficulty accepting the change in their loved one who may now be irritable, sexually inappropriate, and may lack

spontaneity and/or have poor judgment. Studies have been conducted which confirm the association between the level of stress felt by the family and the emotional and behavioral changes displayed by the patient.[25]

In some cases, the TBI patient may not have family available to provide rehabilitation and overall supervision. The family may not be supportive or available due to work commitments, or the patient may not have a family at all. In these situations, the patient may need a full-time home health aide or companion to assist with activities of daily living (ADLs) and encouragement regarding safety issues. ADLs may include walking, bathing, dressing, companionship, and chore services, such as shopping, meal preparation, and light housekeeping.[20] In most cases, hospital discharge planners will help arrange home health care or respite services before the patient is discharged and physical therapists play an instrumental part in identifying the patient's particular needs.

Because the family has lived through and participated in the patient's life experiences, their involvement in the patient's rehabilitation is extremely important. Family members are usually a great source of motivation and support for their family member and are encouraged to participate in the treatment program. At discharge, it is very often the family members who carry out the patient's ongoing care and provide therapy. Family members need a clear understanding of the patient's capabilities, the stage of recovery, and the prognosis. Educating family is not always an easy task. Family members see

the physical disabilities but fail to understand that behavioral problems can often pose a great threat to the patient's functional existence and independence in the community.

Family members will need to reinforce the importance of societal expectations and encourage the patient to behave in an acceptable manner. TBI patients may lack insight into their own personal and intellectual changes, which can pose additional consequences to the underlying problem. The patient may become lonely as a result of less contact with friends and fewer opportunities to make new friends. Group and individual counseling are appropriate while physical, occupational, and recreational therapists start social and community reentry programs.[21]

Families can help traumatic brain injury patients (TBI) relearn how to manage themselves in a variety of environments, including home and the community. Retraining programs start in the hospital or rehabilitation center and team members can gradually assist the TBI patient in managing time and accepting responsibility. The patient can be encouraged to make the hospital bed, select clothing, perform routine exercises, arrive at therapy at scheduled times, and make phone calls independently. Gradually, the patient can re-enter the community by accomplishing tasks such as making change, shopping, using public transportation, crossing the street, and interacting with people. The return to community with family and other team members can assist with learning new skills and adapting those skills previously learned.[21]

Just as family members need to be supportive in the rehabilitation process, the multidisciplinary team must be sensitive to and supportive of the family. In many ways, the TBI affects the family as much as it does the patient. It is critical for the family members to take care of themselves as well as their loved one. No one knows how long it may be before the TBI patient will return to a "normal" level of independence. Caring for and supervising a TBI patient with significant memory loss and cognitive impairments can be physically and emotionally exhausting for those family members involved. Families and caregivers can take care of themselves by allowing others to help, taking breaks, eating and sleeping properly, and remembering to stay positive and have fun.

As the security of the family structure is changed, families are forced to alter their priorities and compromise their plans for the future.[23] Health care professionals should not underestimate the significance of this change.

The Brain Injury Association State Network Listing Resources is provided in Appendix A to supply the family with any additional information they may need. Discharge planners and social workers are also excellent sources for support groups and information. Families should be encouraged to find these support groups very early to help maximize the course of rehabilitation. In addition, most home health care agencies are listed in the yellow pages under "Nursing" or "Home Health."

CHAPTER V

CONCLUSION

Research and clinical experience have clearly established that behavioral and emotional disorders are the most complex and socially disabling of any dysfunctions commonly seen in patients with TBI.[11,20,24] The rehabilitation of patients with behavioral and emotional disorders secondary to TBI is challenging for the family and physical therapist. This challenge is due to the combination of pre-injury personality, specific damage to the brain, environmental demands, and emotional reactions to the changes that have occurred. These changes in personality and social behavior limit the chance for successful return to work or school, independent living, and the social relationships with peers and family members. Therefore, it is critical to develop effective behavioral and emotional control by developing psychosocial treatment strategies before physical capabilities can be maximized. Further investigation in the area of psychosocial treatment is needed, but is limited by the diversity, variety, and complexity of each particular patient's individuality.

Family members and significant others must be informed of the traumatic brain injury (TBI) epidemic in terms of epidemiology, etiology, measurement scales, and pathophysiology to increase their awareness of problems associated

with their loved one. In addition, information and resources as well as specialized treatment technique specific to the needs of the patient and family are imperative in order to maximize the TBI patient's functional capabilities.

With this in mind, it is the responsibility of every team member to provide support by addressing and considering the factors described in this paper regarding the psychosocial impact of the TBI on the patient and family.

APPENDIX A

BRAIN INJURY ASSOCIATION, INC.
(formerly National Head Injury Foundation, Inc.)

1776 Massachusetts Avenue, N.W.
Suite 100
Washington, DC 20036-1904
(202) 296-6443 • Fax: (202) 296-8850

BRAIN INJURY ASSOCIATION, INC.
STATE ASSOCIATION NETWORK LIST

NOVEMBER 1995

Revised November 22, 1995

BRAIN INJURY ASSOCIATION
STATE NETWORK LISTING

The following states have become fully chartered associations under the Brain Injury Association:

Brain Injury Association of **ALABAMA**
P.O. Box 550008
Birmingham, AL 35255

**** or ***** (UPS only)
3600 8th Avenue South
Birmingham, AL 35255

Phone: (205) 328-3505
(800) 433-8002 (in state)
Fax: (205) 328-2479
Hours: 8:30 a.m. - 5:00 p.m.
President: Kim Ferguson
Exec. Dir.: Charlie Priest

ARIZONA Head Injury Foundation
630 N. Craycroft Road, Suite 139
Tucson, AZ 85711-1441

Phone: (602) 747-7140
(800) 432-3465 (in state)
Fax: (602) 790-4409
Hours: 9:00 a.m. - 5:00 p.m.
M/W/F, answering machine
President: David Anderson
Exec. Dir.: Rhoda Sokal
Office Manager: Ellen Conroy

ARKANSAS Head Injury Foundation
106 Kansas
Little Rock, AR 72118

Phone: (501) 771-5011
1-800-235-2443
Hours: 8:00 am - 4:30 pm, (M-F)
President: Dale Turrentine, (Acting)
Exec. Dir.: Emily Allen

CALIFORNIA Head Injury Foundation
P.O. Box 160786
Sacramento, CA 95816-0786
********** **UPS ONLY**
1020 11th Street, Suite 210
Sacramento, CA 95814

Phone: (916) 442-1710
(800) 457-CHIF
Fax: (916) 442-7305
Hours: 10:00 am - 4:00 pm, (M-F)
President: Elizabeth Alexander
Exec. Dir.:

COLORADO Head Injury Foundation
5601 S. Broadway, Suite 350
Littleton, CO 80121

Phone: (303) 730-7112
(800) 955-2443 (in state)
Fax: (303) 730-7828
Hours: 9:00 am - 5:00 pm, (M-F)
President: Jonathan Woodcock, MD
Exec. Dir.: Helen Kellogg (acting)

Brain Injury Association of CONNECTICUT
1800 Silas Deane Highway, Suite 224
Rocky Hill, CT 06067

Phone: (860) 721-8111
(800) 278-8242 (in state)
Fax: (860) 721-9008
Hours: 8:30 a.m. - 4:30 p.m.
M-F, answering machine
President: Linda Detelich
Exec. Dir.: Kathleen Ryan

DELAWARE Head Injury Foundation
P.O. Box 9876
Newark, DE 19714
***** or ***** (UPS only)
Sy Londoner (302) 239-4650
823 Grande Lane
Hockessin, DE 19707

Phone: (302) 475-2286
Hours: Answering Service
President: Sy Londoner
Exec. Dir.:

FLORIDA Head Injury Association
North Broward Medical Center
201 E. Sample Road
Pompano Beach, FL 33064

Phone: (305) 786-2400
(800) 992-3442 (in state)
Fax: (305) 786-2437
Hours: 9:00 am - 5:00 pm, (M-F)
President: Maria Gibson
Exec. Dir.: Ellie Kazuk

Brain Injury Association of GEORGIA
1447 Peachtree Street NE
Suite 810
Atlanta, GA 30309

Phone: (404) 817-7577
Fax: (404) 817-7521
Hours: 24 hour answering machine
President/CEO: Gloria Stahle
Chair: Alison Anderson

BIA/ILLINOIS
1127 South Mannheim Road
Suite 213
Westchester, IL 60154

Phone: (708) 344-4646
(800) 699-6443 (in state)
Fax: (708) 344-4680
Hours: 10:00 am - 4:00 pm (M-F)
President: Marvel Vena
Exec. Dir. Joyce Hrovatin

Head Injury Foundation / **INDIANA**
5506 East 16th Street, Suite B5
Indianapolis, IN 46218-4930

Phone: (317) 356-7722
Fax: (317) 356-4241
(800) 407-4246 Helpline
Hours: 8:00 a.m. - 4:30 p.m.
M-F, answering machine
President: Karen May
Exec. Dir.: Sue Ellen Collins

Brain Injury Association of **IOWA**
2101 Kimball Avenue, LL7
Waterloo, IA 50702

Phone: (319) 291-3552
(800) 475-4442 (in state)
Fax: (319) 291-3484
Hours: 9:00 am - 4:00 pm, (M-F)
President: Karen Johnson
Exec. Dir.:

HEAD INJURY ASSOCIATION OF **KANSAS** & GREATER KANSAS CITY
1100 Pennsylvania, Suite 305
Kansas City, MO 64105-1336

Phone: (816) 842-8607
(800) 783-1356
Fax: (816) 842-1531
Hours: 9:00 am - 5:00 pm, (M-F)
24 hour answering machine
President: Suzanne E. Dotson
Exec. Dir.: Elizabeth Jenkins

Brain Injury Association of **KENTUCKY**
3910 Dupont Square South, Suite D
Louisville, KY 40207-4648

Phone & Fax: (502) 899-7141
(800) 592-1117
President: Peggy Igleheart
Exec. Dir.: Robert E. Ayres

LOUISIANA Head Injury Foundation
217 Buffwood Drive
Baker, LA 70714-3755

Phone: (504) 775-2780
Fax: (504) 387-6252
Hours: 8:30 a.m. - 5:00 p.m.
M-F, answering machine
President: William Moak
Exec. Dir.:

Brain Injury Association of **MAINE**
424 Western Avenue
Augusta, ME 04330

Phone: (207) 626-0022
(800) 275-1233
Fax: (207) 622-6947
Hours: 8:00 am - 5:00 pm, (M-F)
President: Beverley Bryant
Exec. Dir.: Nancy Chase

Brain Injury Association of **MARYLAND**
916 S. Rolling Road
Baltimore, MD 21228

Phone: (410) 747-7758
(800) 221-NHIF (in state)
Fax: (410) 747-7759
Hours: 24 hour answering machine
President: Frances Bateson
Exec. Dir.:

MASSACHUSETTS Head Injury Association
Denholm Building
484 Main Street, #325
Worcester, MA 01608

Phone: (508) 795-0244
(800) 242-0030 (in state)
Fax: (508) 757-9109
Hours: 9:00 am - 4:00 pm, (M-F)
24 hour answering
President: Russell Robbins
Exec Dir: Arlene Korab

Brain Injury Association of **MICHIGAN**
8137 W. Grand River, Suite A
Brighton, MI 48116

Phone: (810) 229-5880
(800) 772-4323 (in state)
Fax: (810) 229-8947
Hours: 9:00 am - 5:00 pm, (M-F)
President/CEO: Mike Dabbs
Chairman: Sue Hoppe

Brain Injury Association of **MINNESOTA**
43 Main Street SE
Suite 135
Minneapolis, MN 55414

Phone: (612) 378-2742
(800) 669-MHIA (in state)
Fax: (612) 378-2789
Hours: 8:00 am - 4:30 pm, (M-F)
Chairman: William O'Dowd, Ph.D.
Exec. Dir.: Tom Gode

MISSISSIPPI Head Injury Association
P.O. Box 55912
Jackson, MS 39296-5912

Phone: (601) 981-1021
(800) 641-6442
Fax: (601) 981-5562
Hours:
24 hour answering machine
President: Janie Jones (acting)
Exec. Dir.: Carol Trevathan

***** or *****
2727 Old Canton Road, Suite 191
Jackson, MS 39296

MISSOURI Head Injury Association
P.O. Box 37070
St. Louis, MO 63141

Phone: (417) 888-7708
Fax:
(800) 377-6442 (in state)
Hours: 9:00 am - 5:00 pm, (M-F)
President: Michael Whetstone, Ph.D.
(acting)

***** or ***** **UPS ONLY**
700 Corporate Park Drive
Suite 330
St. Louis, MO 63105

Brain Injury Association of **MONTANA**
Inst. for Health & Human Services
Eastern Montana College, Room 235
1500 N. 30th Street
Billings, MT 59101-0298

Phone: (406) 657-2077
Fax: (406) 761-5110
(800) 241-6442
Hours: 8:00 am - 12:00 am, (M-F)
24 hour answering machine
President: Mike Hagen
Exec. Dir.: Robin Childers

NEBRASKA Head Injury Association
P.O. Box 397
Route 1, Box 132
Milford, NE 68405

Phone: (402) 761-2781
(800) 743-4781 (in state)
Fax: (402) 761-2219
Hours: Answering Machine
President: Jeanne Prauner
Exec. Dir.: Linda Burkey

NHIF/**NEW HAMPSHIRE** Association
2 1/2 Beacon Street, Suite 171
Concord, NH 03301

Phone: (603) 225-8400
Hours: 8:30 am - 4:30 pm, (M-F)
President: John Richards
Exec. Dir.: Steven Wade

NEW JERSEY Head Injury Association
1090 King George Post Road #708
Edison, NJ 08837-3722

Phone: (908) 738-1002
Fax: (908) 738-1132
(800) 669-4323 (in state)
Hours: 9:00 a.m. - 5:00 p.m.
President: Evie Bird
Exec. Dir.: Barbara Geiger-Parker

NEW MEXICO Head Injury Foundation
2819 Richmond, N.E.
Albuquerque, NM 87107

Phone: (505) 889-8008
(800) 279-7480 (in state)
Fax: (505) 883-1079
Hours: 12:00 pm - 4:00 pm, (M-F)
President: Charlotte Lock
Exec. Dir.:

NEW YORK State Head Injury Association
10 Colvin Avenue
Albany, NY 12206

Phone: (518) 459-7911
(800) 228-8201 (in state)
Fax: (518) 482-5285
Hours: 8:30 am - 5:00 pm, (M-F)
President: Maureen Campbell-Korves
Exec. Dir.: Judy Avner

Brain Injury Association of NORTH CAROLINA
133 Fayetteville St. Mall
Suite 310
Raleigh, NC 27601

Phone: (919) 833-9634
(800) 377-1464 (in state)
Fax: (919) 833-5415
Hours: 8:30 a.m. - 5:00 p.m.
M-F, answering machine
President: Betty Lilyquist
Exec. Dir.: Cecil Greene, Jr.

Head Injury Association of NORTH DAKOTA
2111 E. Main Avenue, Suite 14
West Fargo, ND 58708

Phone: (701) 281-0527
(800) 279-6344 (in state)
Fax: (701) 281-3878
Hours: 10:00 am - 4:00 pm, (M-F)
President: Bonnie Melander
Acting Exec. Dir.: Sandra Riely

The OHIO Head Injury Association
1335 Dublin Road, Suite 50A
Columbus, OH 43215-1000

Phone: (614) 481-7100
(800) 686-9563 (in state)
Fax: (614) 481-7103
Hours: 9:00 am - 4:00 pm, (M-F)
24 hour answering machine
President: June Evans
Exec. Dir.: Suzanne Minnich

Brain Injury Association of OKLAHOMA
P.O. Box 88
Hillsdale, OK 73743-0088

**** or **** (UPS only)
1 Elevator Road
Hillside, OK 73743

Phone: (405) 635-2237
(800) 765-6809 (in state)
Fax: (405) 635-2238
Hours: 8:00 am - 5:00 pm, (M-F)
24 hour answering service
President: Charles Bell
Exec. Dir.: Charlotte Bowen

OREGON Head Injury Foundation
1118 Lancaster Drive NE, Ste 345
Salem, OR 97301

Phone: (503) 585-0855
(800) 544-5243 (in state)
Hours: 10:00 am - 2:00 pm, (M-F)
24 hour answering service
BoardChair: Steve Paysinger
Exec. Dir:

SOUTH CAROLINA Head Injury Association
P.O. Box 1945
Orangeburg, SC 29116
***** or ***** (UPS only)
1587 Tolly Ganly Circle
Orangeburg, SC 29115

Phone: (803) 533-1613
(800) 767-9701 (in state)
Hours: 24 hour answering machine
Fax: (803) 531-3376
President: Charles McLafferty
Exec. Dir.:

Brain Injury Association of **TENNESSEE**
599 W. Main Street, Ste 208
Hendersonville, TN 37075

Phone: (615) 264-3052
(800) 480-6693
Hours: 8:00 a.m. - 4:30 p.m.
Monday - Friday
President: Jim McEvers
Exec. Dir.: Gary Driskill

TEXAS Head Injury Association
5633 Highway 290 East
Suite 306
Austin, TX 78723

Phone: (512) 467-6872
(800) 392-0040 (in state)
Fax: (512) 467-9035
Hours: 8:30 am - 5:00 pm, (M-F)
President: Marcine Garis
Vol. Exec. Dir.: Tad Thayer

UTAH Head Injury Association
1800 S. West Temple, Suite 203, Box 22
Salt Lake City, UT 84115

Phone: (801) 484-2240
(800) 281-8442
Fax: (801) 484-5932
Hours: 24 hour answering machine
President: Pat Allen
Exec. Dir.: Ron S. Roskos

VERMONT Association/NHIF
P.O. Box 1837, Station A
Rutland, VT 05701
***** or ***** (UPS only)
c/o Lenny Burke Farm
Route 7
Wallingford, VT 05773

Phone: (802) 446-3017
Hours: 24 hour answering service
President: Richard Marceau
Exec. Dir.: Emmie Burke

Brain Injury Association of **VIRGINIA**
3212 Cutshaw Avenue, Suite 315
Richmond, VA 23230

Phone: (804) 355-5748
(800) 334-8443 (in state)
Fax: (804) 355-6381
Hours: 8:30 a.m. - 5:00 p.m.
M-F, answering machine
President: Peter Patrick
Exec. Dir.: Harry Weinstock

Brain Injury Association of **WASHINGTON**
300 120th Avenue, N.E.
Building 3, Room 131
Bellevue, WA 98005

Phone: (206) 451-0000
Fax: (206) 637-8436
(800) 523-LIFT (in state)
Hours: 9:00 a.m. - 5:00 p.m.
M-F, answering machine
President: Ron Finlay
Exec. Dir.: Tony Screws

WEST VIRGINIA Head Injury Foundation
P.O. Box 574
Institute, WV 25112-0574
***** or ***** (UPS only)
Barron Drive, Building C
Institute, WV 25112-0574

Phone: (304) 766-4892
(800) 356-6443 (in state)
(304) 346-3904 emergency
Fax: (304) 766-4940
Hours: 8:30 am - 4:30 pm, (M-F)
24 hour answering machine
President: Cindy Ashworth
Exec. Dir.: Jennifer J. Rhule

WISCONSIN Brain Trauma Association
735 N. Water Street, Suite 701
Milwaukee, WI 53202

Phone: (414) 271-7463
(800) 882-9282 (in state)
Fax: (414) 271-7166
Hours: 9:00 a.m. - 5:00 p.m.
M-F, answering machine
President: Gary L. Jackson
Exec. Dir.:

WYOMING Brain Injury Association
246 South Center, Suite 206
Casper, WY 82601

Phone: (307) 473-1767
(800) 643-6457 Nationwide
Fax: (307) 237-5222
Hours:
President: Kay Potter
Exec. Dir.: Lesley Travers

BRAIN INJURY ASSOCIATION
STATE NETWORK LISTING

November 22, 1995

The following are BIA contacts in the representative state. At present, some are organized groups working toward affiliate status; others are key individuals for networking purposes:

ALASKA Head Injury Foundation
3121 E. 18th Avenue
Anchorage, AK 99504

Phone: (907) 337-1441
Contact: Debbie Russell

DALLAS Head Injury Association
Concourse Office Park
5350 LBJ Freeway, Suite 250
Dallas, TX 75240

Phone: (214) 233-4777
Hours:
Exec. Dir: Shannon Craft

IDAHO Head Injury Association
76 West 100 North
Blackfoot, ID 83221

Phone: (208) 785-0685
Hours: 8:00 a.m. - 4:40 p.m. M-F, answering machine
Contact: Nicolette Parsons

LONG ISLAND Head Injury Assoication
65 Austin Blvd.
Commack, NY 11725

Phone: (516) 543-2245
Fax: (516) 543-2261
Contact: Charles Wolf

Brain Injury Association of the **MID-SOUTH**
499 Patterson, Room 205B
Memphis, TN 38111

Phone: (901) 452-3035
Hours: 8:30 - 5:30 p.m.
Contact: Brad Evans

MISSOURI Head Injury Association
St. Louis Chapter
P.O. Box 32025
St. Louis, MO 63132

Phone: (314) 423-6442
Fax: (314) 423-9162
Hours: 8:30 - 4:00 p.m.
Exec. Dir: Joan Pace

NEWPORT Traumatic Brain Injury Association
Borden-Carey Building
60 Sachuest Way
Middletown, RI 02842-5748

Phone: (401) 847-2085
Hours:
Contact: Diane Coffey

PACIFIC Head Injury Foundation
1775 So. Beretania
Room 203
Honolulu, HI 96826

Phone: (808) 941-0372
Hours:
President: Michael Sullivan

NHIF/RHODE ISLAND Association
Independence Square
500 Prospect Street
Pawtucket, RI 02860

Phone: (401) 725-2360
Fax: (401) 727-2810
Hours: 9:00 a.m. - 4:30 p.m. M-F, answering machine
President: Robert Campo
Exec. Dir.: Sharon Brinkworth

SOUTH CAROLINA Association of Independent Head Injury Groups
112 Winthrop Avenue
Greenville, SC 29607

Phone: (803) 455-7705
Hours:
Pres: Maria Glenn, RN, CRRN, CNA (Dir. of Working Nurses) Roger C Peace Rehab.Hosp. 701 Grove Road Greenville, SC 29605

SOUTH DAKOTA Brain Injury Association
221 South Central, Suite 32
Pierre, SD 57501

Phone: (605) 224-0937
Fax: (605) 224-0909
Hours: 9:00 am - 3:00 (M-F)
President: Louise Nash
Exec. Dir.: Virginia Schank

NORTHERN NEVADA HEad Injury Association
c/o Janet Shapiro
Nevada Community Enrichment Program (NCEP)
700 Smithridge Drive, Suite C
Reno, NV 89502

Phone: (702) 828-7171

SOUTHERN NEVADA Head Injury Association
4074 Autumn Street
Las Vegas, NV 89120

Phone: (702) 452-2674
Hours:
President: Francisca Lara

SOUTH DAKOTA Brain Injury Association
38560 127th Street
Aberdeen, SC 57401

Contact: Louise Nash

Brain Injury Association/TEXAS
Gulf Coast Area
1700 West Loop South
Suite 300
Houston, TX 77027

Contact: Peter Segelke

WASHINGTON, DC Head Injury Foundation
2100 Mayflower Drive
Lake Ridge, VA 22192

Phone: (202) 877-1464
Hours: 9:00 a.m. - 5:00 p.m.
V.P. Pres: Karen Tyner
Exec. Dir.:

NOVA SCOTIA Head Injury Association
P.O. Box 499
Dartmouth, NS B2Y 3Y8
CANADA

Phone: (902) 425-5060
Hours:
Secretary: Mary Bourgeois

REFERENCES

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